

# Prevalence of Pterygium and Outcome of Pterygium Surgery in Hilly Western Nepal: A Hospital based Study

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## ABSTRACT:

**Introduction:** Surgical removal is the treatment of choice for pterygium; however, prevention of recurrence is a challenge. Several techniques have been tried to reduce the fibro-vascular activity aiming to reduce rate of recurrence such as B-irradiation, conjunctival and limbal auto-grafting, anti-mitotic drugs, and amniotic membrane transplantation. This study reports the magnitude of the disease in a hilly region of western Nepal and outcome of excision and conjunctival autografting for pterygium surgery. **Methods:** A prospective study was done from 1<sup>st</sup> July 2015 to 31<sup>st</sup> December 2016 in which all patients with primary pterygium presented to Palpa Lions Lacoul Eye Hospital from 1<sup>st</sup> July 2015 to 30<sup>th</sup> June 2016 were treated and followed up for next six months. Patients were treated medically or surgically as indicated. Data on age, sex, visual acuity, extent of disease, treatment modality, complications, and outcome were collected and analyzed by descriptive statistics, Chi-square test, t-test, and Anova tests. *P* value less than 0.05 was considered significant. **Results:** There were 18,960 patients in total attending hospital for various conditions among which 290 (1.53%) had pterygium. There were 186 (64.1%) female and 104 (35.9%) male and this difference was significant ( $p < 0.001$ ). The mean age was 47.42 yrs ( $SD = 14.23$ ) with age ranging from 20 to 80 years. Right eye was affected more (43.1%) than left eye (33.1%); remaining 23.8% had bilateral disease. Grade-1 disease occurred in younger age compared to Grade-2 and Grade-3 disease. All grade-1 patients were managed medically; grade-2 and grade-3 patients were equally likely to be managed medically or surgically. There were no major intra or post-operative complications. Minor post-operative complications noted were subconjunctival hemorrhage, corneal scarring, suture gaping, and conjunctival cyst among others. **Conclusion:** Despite much advanced techniques in pterygium surgery, pterygium excision combined with conjunctival autograft is found to be a safe and effective method for treating pterygium in developing world.

**Keywords:** autograft • conjunctiva • prevalence • pterygium • recurrence

## INTRODUCTION:

Pterygium is an abnormal fibro-vascular conjunctival tissue which encroaches the cornea. It

is triangular in shape and is a benign lesion more frequently located nasally than temporally. Ocular irritation, hyperemia and vision loss are the most common clinical symptoms of pterygium.[1] The disease is more common in hot, dry, and sunny climate. The elastotic degeneration of conjunctival collagen is the main histopathological changes in pterygium.[2]

Worldwide, the prevalence of pterygium varies with age, occupation, geographical location, and dry and dusty environment. In Nepal, there is paucity of data regarding the prevalence and associated risk factors of pterygium.[3] Although surgical removal of pterygium is the treatment

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of choice, preventing recurrence is even bigger challenge. Several techniques have been tried to reduce the fibro-vascular activity aiming to reduce rate of recurrence such as B-irradiation, conjunctival and limbal auto-grafting, anti-mitotic drugs, and amniotic membrane transplantation (AMT).[4] Rates of recurrence varies from 2% for excision with CAG (Conjunctival autograft) to 89% for bare sclera.[5]

Though the disease is common in hot and tropical regions, we encounter many cases of pterygium in our hospital which is located in a relatively cooler climate. This study was conducted to report the magnitude of the disease in hilly area like Palpa, and outcome of pterygium excision surgery with conjunctival auto grafting which is the treatment done routinely for this condition in our hospital.

**METHODS:**

This prospective, analytical study was done from 1<sup>st</sup> July 2015 to 31<sup>st</sup> December 2016. All patients with pterygium who attended Palpa Lions Lacoul Eye Hospital from 1<sup>st</sup> July 2015 to 30<sup>th</sup> June 2016 were treated medically or surgically as indicated. Patients operated during this period were followed for six months after surgery. Data regarding age, sex, occupation, extent of pterygium, pterygium recurrence after three months and six months, and post-operative complications were recorded. Recurrent pterygium and pseudo pterygium were excluded from the study.

Preoperatively a complete ophthalmologic examination including measurement of visual acuity, slit lamp examination, intraocular pressure measurement, and funduscopy was performed. The pterygium was graded according to extent of corneal involvement as in Table 1.

This study was approved by Ethical Committee of Lumbini Eye Institute.

Table 1: Grading of Pterygium

Grade-1	Between limbus and a point midway between limbus and pupillary margin
Grade-2	Head of pterygium present between a point midway between limbus and pupillary margin (nasal pupillary margin in case of nasal pterygium and temporal margin in case of temporal pterygium)
Grade-3	Crossing pupillary margin

**SURGICAL TECHNIQUE:**

In each case, peribulbar anesthesia consisting of five ml of 2% lidocaine and five ml of 0.5% bupivacaine with one ml of 150 units/ml of hyaluronidase was injected into the peripheral spaces of orbit. Injection was given at the junction of outer one third and inner two third of lower orbital rim. If adequate block was not obtained, additional superior injection was given nasally just above medial canthus. After applying lid speculum, the head of the pterygium was dissected from the cornea up to the limbal margin along with the underlying Tenon capsule and excised using Wescott scissors. Hemostasis was maintained with minimal wet field cautery if needed. The corneal bed of the pterygium was scraped with a crescent knife. After pterygium excision, the autograft was taken from the superior bulbar conjunctiva of same eye adjacent to the limbus after rotating the eyeball downwards. Tenon tissue was spared when preparing the graft. The free graft was placed on the bare sclera so that the epithelial side faces up and that the limbal edge adjacent to the recipient limbus. The graft was held in place with multiple sutures with 8-0 vicryl.

All patients were started on combination of topical steroid (dexamethasone 0.1%) and antibiotic (chloramphenicol 1%) from first post-operative day and was tapered over six weeks. Patients were followed up at two weeks, three months, and six months. During each visit, operated eye was examined under slit lamp and post-operative complications and recurrence were noted.

Recurrence was defined as the encroachment of both fibrous and vascular tissue more than one mm crossing the corneo-scleral limbus into the area of previous excision. The extent of recurrences was determined by clinical examination under slit lamp in those patients attending for follow up.

Data were collected in Microsoft Excel 2010 and analysis was done with Statistical Package for Social Sciences (SPSS-21). Chi-square test was done to study the relationship between categorical data, student t-test was done to compare mean in two groups, one way Anova test was done to compare mean in more than two groups, non-parametric tests were applied for ordinal data. P value <0.05 was considered statistically significant.

**RESULTS:**

During the study period, a total of 18,960

patients attended hospital outpatient department. Among them, 290 (1.53%) had pterygium; so, the prevalence of pterygium was 1.53% among the hospital population.

There were 186 (64.1%) female and 104 (35.9%) male with M:F ratio of 1:1.79. Comparing to the equal presence of both gender in our hospital, this difference is statistically significant ( $X^2[N=290, df=1] = 174.3, p < 0.001$ ). Thus, females were more likely to be affected from this condition. Mean age of all patients was 47.42 year ( $SD=14.23$ ) and range was 20 to 80 years. There were 221 (76.2%) cases with unilateral and the rest 69 (23.8%) with bilateral involvement. Among the patients with unilateral involvement, 125 (56.6%,  $N=221$ ) had involvement of right eye whereas the rest 96 (43.4%,  $N=221$ ) had left eye involvement. Occupation of the patients is outlined in Table 2. Nearly half ( $n=143, 49.3%$ ) of them were farmers.

Table 2: Occupation of patients with pterygium

Occupation	n	%
Agriculture	143	49.3
Domestic affairs	81	28
Service	36	12.4
Business	20	6.9
Student	10	3.4
<b>Total</b>	<b>290</b>	<b>100.0</b>

There were 215 (74.1%) patients with grade-1 pterygium, 68 (23.4%) with grade-2, and seven (2.4%) with grade-3 pterygium. Average age of patients with grade-1 pterygium was 45.25 years ( $SD=13.18$ ), grade-2 was 52.88 ( $SD=15.85$ ), and grade-3 was 61 years ( $SD=5.86$ ). Anova test showed a significant difference in the mean age of these groups ( $F=11.48, N=289, df=2, p<0.001$ ). A post-hoc analysis showed that the difference was significant between patients with grade-1 and grade-2 condition. Similarly, the difference was significant between grade-1 and grade-3 but it was not significant between grade-2 and grade-3. This showed that the age of patients with grade-1 pterygium was significantly lower than those having grade-2 or grade-3 pterygium. Four patients had double headed pterygium in the same eye. Visual acuity of the patients presenting with the disease who were treated by surgery is shown in Table 3. It showed that nearly half (47.1%) had normal 6/6 vision.

Table 3: Visual acuity of patients undergoing pterygium surgery

Visual acuity	n	%
6/6	24	47.1
6/9	10	19.6
6/12	5	9.9
6/18	6	11.8
6/24	1	1.9
6/36	2	3.9
6/60	1	1.9
5/60	1	1.9
2/60	1	1.9
<b>Total</b>	<b>51</b>	<b>100</b>

All the cases with grade-1 disease were treated medically. Among the remaining 75 cases, 66.2% ( $n=45, N=68$ ) of those with grade-2 and 85.7% ( $n=6, N=7$ ) with grade-3 disease were treated surgically. The difference in the rate of surgery between patients with grade-2 and grade-3 disease was not statistically significant (Fisher exact = 0.42). Thus, patient with grade-I pterygium were always managed medically whereas grade-2 and grade-3 patients were equally likely to be managed medically or surgically.

The only intra-operative complication noted in this study was button-holing of the conjunctival graft in one patient. The common postoperative complaints were irritation, photophobia, foreign body sensation, and hyperemia which occurred in most of the patients. There were no major complications like corneal perforation or endophthalmitis. Minor post operative complications noted were sub-conjunctival hemorrhages, corneal scarring, suture gaping, and

Table 4: Complications in patients undergoing pterygium surgery (N=51)

Complications	n	%
Sub-conjunctival hemorrhage	6	11.8
Corneal Scarring	5	9.8
Suture Gaping	4	7.8
Conjunctival cyst	2	3.9
Papillary conjunctivitis	2	3.9
Flap retraction	1	2

conjunctival cyst among others (Table 4). None of the eyes had problems at the donor site.

**DISCUSSION:**

The prevalence of pterygium in this study

was found to be only 1.53% ( $n=290$ ,  $N=18,960$ ) of the total hospital population. This is much lower than in the study done at upper Mustang by Maharjan et al.[3] (10.1%,  $n=133$ ,  $N=1319$ ) and in China by Jiao et al.[6] (10.53%,  $n=1876$ ,  $N=17,816$ ). This explains association between high exposure to dry and dusty environment, sunlight, and ultraviolet radiation in areas like upper Mustang.

We observed that the mean age of patients was 47.42 year ( $SD=14.23$ ) which is similar to the studies done by Maharjan et al.[3] ( $M=45.83$ ,  $SD=17.94$ ) and Sharma et al.[7] ( $M=43.88$ ,  $SD=9.19$ ). Some other studies showed a different mean age. In a study by Bastola, mean age was 35 years ( $SD=18$ ) which was quite low despite the study being done on similar area as ours.[8] In another study by Varssano et al.,[9] mean age was 53.73 yrs. We found pterygium was prevalent in a wide range of age (20-80 yrs) which shows that pterygium is prevalent in all age groups.

In our study, female (64.1%) outnumbered male and similar was the findings by Sharma et al.[7] (61.85%), and Bastola,[8] (69%), and Dhakwa et al.[10] (55.4%). Female predominates might be because of high prevalence of dry eyes due to fluctuation of estrogen and androgen hormones seen in women, particularly in menopausal women. In addition they are more exposed to kitchen smoke and agricultural activities in this place. However, other studies showed male preponderance eg. Fernandes et al.[5] (53.9%), Heurva et al.[11] (64%), and Paracha et al.[12] (64%).

Most of our patients were involved in agriculture (49.3%) and domestic affairs (27.9%) which supports the association of pterygium with the exposure to dust and UV rays in farmers and outdoor workers. Most of the kitchens in our place still cook in wood fire which emits a lot of smoke and cause irritation of the conjunctiva. But, a study by Sharma et al.[7] showed predominance of service holders (41.2%) followed by farmers (29.4%) in their study. More number of service holders may be because of the study place being slightly urban with more educated population.

Surgical technique has been considered one of the determining factors in influencing the recurrence. We have reviewed many studies about success rates in pterygium surgery with conjunctival autografting. There was no recurrence in our study. It is comparable to those by Prabhakar et al.[13], Bastola,[8] and Das et al.[14] There was no

recurrence in those study too, but the difference was that we used vicryl 8-0 suture while Prabhakar et al. used 8-0 Ethicon silk sutures and Bastola used 10-0 nylon suture. Moreover, our follow up period was less as compared to those studies by Prabhakar et al. (18 months) and Bastola (12 months).

Beside longer surgical time, graft suturing also carries the risk of complications like granuloma formation, and discomfort with exposed suture ends after surgery, and if non-absorbable stitches are used there is the need for suture removal. Though polyglactin and nylon both are effective suture materials for autograft suturing, polyglactin sutures caused slightly more conjunctival reactions postoperatively as compared to nylon sutures. The use of fibrin glue used for attaching the conjunctival autograft in pterygium surgery not only reduces surgical time but also decreases conjunctival hyperemia, and ocular discomfort as compared with nylon 10/0 or with vicryl sutures; this proved conjunctival autografting is an excellent option for attachment of graft in pterygium surgery. [10] Ronamo et al.[15] and Karalezli et al.[16] also found that the use of fibrin glue in pterygium surgery with conjunctival autografting reduces surgery time, improves postoperative patient comfort, and results in a lower recurrence rate compared with suturing. Fibrin glue, however, is costly and many people from our place may not afford it.

Rao et al.[17] highlighted that the surgical technique could probably be the important determining factor for recurrence. He emphasized that the meticulous dissection including limbal tissue conjunctival autograft has great role in the success of the procedure. We also followed the similar surgical technique as described by him using limbal conjunctival autologous grafting consisting of limbal stem cells which act as a barrier to conjunctival cells migrating onto the corneal surface and thus recurrence is prevented.

Recurrence rate of pterygium surgery varies in different studies. Dhakwa et al.[10] found recurrences in three (1.25%,  $N=240$ ) cases with conjunctival auto graft with suturing. Sharma et al.[7] found recurrences in 8.8% ( $N=34$ ) of the cases. Similarly, recurrence rates were 2.7% in primary pterygium and 4% in recurrent pterygium in a study done by Patel et al.[2] In a case series by Okoye et al.,[18] recurrence rate with amniotic membrane transplantation was 6%. Similarly, Katbab et al.[19] found recurrence in 2% ( $n=1$ ,  $N=50$ ) with amniotic



membrane transplantation. Though the literature showed safety and efficacy of amniotic membrane graft with low recurrence rate, it is still not widely practiced. Proper handling and sterilization could be a challenge, especially in rural areas like ours, which also signifies the use of conjunctival free autologous graft.

Short duration of follow up remains a limitation of this study. We used one way Anova test to see the difference in mean age of patients with different stage of disease. There were only seven cases in a group. Non-parametric test would have

been more appropriate for this analysis.

## CONCLUSION:

Prevalence of pterygium is 1.53% among our hospital population. Despite much advanced techniques in pterygium surgery, pterygium excision combined with conjunctival autograft remains a safe and effective method for treating pterygium in a rural setting.

*Conflict of Interest: None declared.*

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